FORM PTO 1390 (REV 9-2001) U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
34051	
U S APPLICATION NO (If known, see 37 CFR 1 5)	
10/030880	
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE
PCT/FR00/01050	20 April 2000
PRIORITY DATE CLAIMED	
23 April 1999	

TITLE OF INVENTION: DEVICE FOR OPENING AND DISTRIBUTING A BUNDLE OF FILAMENTS WHEN PRODUCING A NONWOVEN TEXTILE WEB

APPLICANT(S) FOR DO/EO/US: MAGGIO, Rosario; SCHMIT, Laurent

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [ ] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [X] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is attached hereto (required only if not communicated by the International Bureau).
   b. [X] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a [X] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [X] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [X] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S C 371 (c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [ ] A substitute specification
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [ ] Other items or information.

Express Mail No. EL609746595US

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, and is addressed to: Assistant Commissioner for Patents, Washington D.C. 20231 on the date indicated below.

Debra A. Peterlin
Name of Person Mailing Correspondence

10/22/2001 Debra A Peterlin
Date Signature of Person Mailing Correspondence

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
10/030880	PCT/FR00/01050	33051

21. [X] The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1040.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$890.00**	890.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$740.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$710.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [X] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 130.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x **$18.00**	$	
Independent claims	- 3 =		x **$84.00**	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$280.00**	$	
TOTAL OF ABOVE CALCULATIONS =				$ 1020.00	
[ ] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.			+	$	
SUBTOTAL =				$ 1020.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$	
TOTAL NATIONAL FEE =				$ 1020.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$	
TOTAL FEES ENCLOSED =				$ 1020.00	
				Amount to be refunded:	$
				charged:	$

a. [X] A check in the amount of $ 1,020.00 to cover the above fees is enclosed

b. [ ] Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 16-0820 . A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO
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SIGNATURE

Joseph J. Corso
NAME

25848
REGISTRATION NUMBER

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Rosario Maggio et al.

Title: DEVICE FOR OPENING AND DISTRIBUTING A BUNDLE OF FILAMENTS WHEN PRODUCING A NONWOVEN TEXTILE WEB

Docket No.: 34051

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified patent application, it is requested that the following amendments be made.

IN THE CLAIMS:

Please cancel claims 1- 4 without prejudice.

Please add the following claims 5 - 11.

5. (new) A device for opening and distributing a bundle of drawn filaments to be formed into a nonwoven textile web deposited on a movable receiving belt, said device comprising an assembly through which said filaments pass before being deposited on the receiving belt, said bundle of drawn filaments being disposed in a curtain configuration and having a bundle width, said assembly including a diffuser having an inlet zone formed by a convergent nozzle extending along the entire bundle width for receiving filaments, a divergent nozzle

connected to said convergent nozzle for receiving filaments from the latter, and a rail for electrostatically charging said filaments before they are deposited on said receiving belt.

6. (new) A device according to claim 5, wherein said convergent nozzle is connected to said divergent nozzle by a rectilinear slot and said rail is mounted within said rectilinear slot immediately upstream of said divergent nozzle.

7. (new) A device according to claim 5, wherein said bundle of filaments is emitted from a drawing slot positioned upstream of said inlet zone and an intake flow of air is provided at the inlet zone by a venturi effect produced in the divergent nozzle by air passing therethrough with said filaments.

8. (new) A device according to claim 7, wherein air is injected into said diffuser and passes from said diffuser through said divergent nozzle.

9. (new) A device according to claim 5, wherein said convergent nozzle includes a pair of converging walls and said divergent nozzle includes a pair of diverging walls.

10. (new) A device according to claim 6, wherein said bundle of filaments is emitted from a drawing slot positioned upstream of said inlet zone and an intake flow of air is provided at the inlet zone by a venturi effect produced in the divergent nozzle by air passing therethrough with said filaments.

11. (new) A device according to claim 10, wherein air is injected into said diffuser and passes from said diffuser through said divergent nozzle.

REMARKS

Attached hereto is a page entitled **"VERSION WITH MARKINGS TO SHOW CHANGES MADE".**

If there are any further fees required by this amendment not covered by an enclosed check, or if no check is enclosed, please charge the same to Deposit Account No. 16-0820, Order No. 34051.

Respectfully submitted,

By: ______________________
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October 22, 2001

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1 - 4 have been cancelled.

Claims 5 - 11 have been added and, therefore, no marked up version is required.

DEVICE FOR OPENING AND DISTRIBUTING A BUNDLE OF FILAMENTS DURING THE PRODUCTION OF A NONWOVEN TEXTILE WEB

Technical field

The invention relates to an improvement made to the installations for making a nonwoven textile web, which is commonly referred to by the generic name of spunbond and which is formed by continuous synthetic filaments.

It concerns more particularly an improvement made to the means for distributing the extruded filaments, after drawing, over a movable transporting belt, over which they are randomly distributed so as to form a regular web, with a weight and thickness which can be adjusted according to the applications.

Prior art

The production of nonwoven webs of the spunbond type goes back decades and consist, generally speaking:

- in extruding a melted organic polymer through a spinneret perforated with holes, so as to form a bundle or curtain of filaments;
- then, in orienting the extruded filaments by drawing by means of one or more fluid-jet, in particular compressed-air, devices,
- and finally, in receiving the bundle of filaments in the form of a web on a movable transporting belt, which is generally subjected to a suction source and the speed of which is adjusted according to the characteristics of the web, in particular thickness, which it is desired to achieve.

After production, the web is consolidated, for example by performing a sizing or calendering, preferably hot calendering, so that the elementary filaments are joined to one another.

Other consolidation treatments may be performed, where appropriate, such as for example a needling treatment (conventional or by fluid jets), and/or the deposition of a bonding substance on the surface or in the interior of the web.

Generally speaking, the installations used to produce such products comprise:

- at least one extruder for a melted organic polymer feeding a spinneret for producing a curtain of filaments;
- a cooling zone for bringing about at least surface solidification of the said extruded filaments;
- a suction device in the form of a narrow chamber of rectangular cross-section, inside which the curtain of filaments is subjected to the action of high-speed air streams causing the filaments to be drawn, which assembly will be referred to hereinbelow by the term "drawing slot" and;
- a means for deflecting and slowing down the air flow at the outlet of the drawing slot and for distributing the filaments randomly over a receiving belt.

In such installations, the filaments emerge at the outlet of the drawing slot in the form of a bundle of filaments grouped together in the mid-plane of the said slot.

These filaments are ejected at very high speed from the said drawing slot, a speed which can reach 3000 m/min or more depending on the state.

In order to obtain a nonwoven web as homogeneous as possible on the receiving belt onto which the filaments leaving the drawing slot are projected, it is necessary not

only to separate the said filaments from one another, but also to slow down their speed before their impact with the said belt, in order to limit the uncontrollable rebound phenomena which generate a heterogeneous formation of the sheet.

To ensure such a break-up and distribution of the curtain of extruded filaments, various techniques have been proposed to date.

The oldest technique, which emerges in particular from the patent GB-A-932 482, and from the patent US-A-3 967 118, consists in electrostatically charging the filaments, which tends to push them away from one another (corona effect).

This technology makes it possible to improve the formation of the sheet when the filaments are ejected at relatively low speed from the drawing slot and, consequently, what are called the grouping-together phenomena of the filaments are dominant over those of the rebounding of the filaments on the belt.

This is the case in particular when the sheet consists of relatively coarse filaments, that is to say with a count greater than or equal to 2.2 dtex per filament, which filaments are generally produced with speeds at the drawing-slot outlet of less than 3000 m/min.

In order to reduce the speed without adding an additional element, it is necessary in this case for the end of the drawing slot on which the electrostatic device is fixed to be situated at a relatively large distance from the receiving belt, of the order of 500 mm or more, in order that the frictional forces of the filaments in the air slow down their speed, thereby limiting the rebound phenomena and thus improving the formation of the sheet.

This device is not entirely satisfactory, since no control of the speed is possible and the filaments are also subjected to all the outside air currents, thereby disrupting the sheet and creating defects.

Finally, the simple friction of the filaments in the air over such a short distance does not permit sufficient slowing-down of their speed which would enable the rebound phenomena of the filaments on the belt to be attenuated sufficiently.

Consequently, it has been proposed, as emerges from the patent US 3 286 896, to fit to the end of the drawing slot (see Figures 7 and 8) a deflecting system to ensure a better distribution and opening of the bundles of filaments produced.

However, since this solution does not give complete satisfaction, it has been proposed, as emerges from the patent US-A-3 325 906, to associate with the divergent nozzle at the drawing-slot outlet an assembly for insufflating air on each side of this divergent nozzle, which creates a negative pressure in the vicinity of the walls, thus attracting the fibres towards the walls, thereby tending to open the bundle of filaments and also slow down the speed thereof.

Such a device, which is satisfactory in theory, nevertheless has a limited effectiveness, since it is mainly the fibres situated on each side of the bundle which are thus "spread", those grouped together at the centre of the said bundle being extremely difficult to separate from one another.

Summary of the invention

Now, it has been found, and this forms the subject of the invention, that it was possible to achieve not only a

perfect opening of the bundle of extruded filaments at the outlet of the drawing slot, but also a very homogeneous distribution over the receiving belt, on the one hand by separating the assembly for opening the bundle of filaments from the actual drawing slot, and on the other hand and above all, by designing this opening assembly such that it combines both the advantages of the techniques of electrostatically charging the filaments and the techniques of opening the bundle by slowing down the air speed at the drawing-slot outlet, and thus the speed of the filaments before reception on the receiving belt.

Generally speaking, the invention thus relates to a device for opening and distributing a bundle of filaments during the production of a nonwoven textile web, according to the technique which consists:

- in extruding a melted organic polymer through a spinneret perforated with holes, so as to form a bundle or curtain of filaments;
- then, in orienting the extruded filaments by drawing by means of one or more fluid-jet devices;
- and finally, in receiving the bundle of filaments in the form of a web on a movable transporting belt below which is arranged a suction source.

The device for opening and distributing the bundle of filaments according to the invention consists of an assembly arranged downstream of the outlet of the drawing assembly and separated therefrom, this assembly comprising, arranged closed to the outlet of the drawing slot, a diffuser comprising an inlet zone in the form of a convergent nozzle extending over the entire width of the installation opposite the outlet of the drawing slot for producing the web, extended by a divergent nozzle, the said assembly being associated with a rail electrostatically

charging the filaments before they are received on the receiving belt.

According to one embodiment, the divergent zone of the diffuser comprises two walls and two lateral slots situated at the top of the said diffuser, on each side thereof, and permitting either an indraught of air from outside owing to the venturi effect, or, where appropriate, an injection of air under a pressure less than one bar and advantageously between 0.4 and 0.8 bar, bringing about an air flow against the walls of the said diffuser.

The above diffuser makes it possible to precisely adjust the width of the bundle of fibres and also the impact speed of the filaments on the receiving belt, the electrostatic charging assembly being able to be situated, where appropriate, downstream of the diffuser assembly, but preferably being integrated inside the latter, thereby accentuating the opening of the bundle of filaments.

Advantageously and in practice:

- the diffuser comprises an inlet zone in the form of a convergent nozzle connected to the two walls of the divergent zone by a rectilinear slot, the rail electrostatically charging the filaments being mounted at the level of the rectilinear slot immediately upstream of the divergent zone;
- the distance of the diffuser from the receiving belt is adjustable, in order to minimise the influence of the outside air currents on the bundle of fibres;
- the pressure of the air which flows in the diffuser against the walls thereof and the adjustment of the voltage applied in the electrostatic rail makes it possible to adapt very precisely the conditions of the formation of the sheet according to the speed of the filaments

at the drawing-slot outlet, thereby making particularly such a device suitable for the formation of a sheet consisting of low-denier filaments, and also for production installations working at high speed;

- finally, the separation of the actual drawing system and that for distributing the curtain of filaments allows a possibility of adjusting the count of the said filaments without changing the appearance of the sheet and vice versa.

Brief description of the drawings

The invention and the advantages which result from it will be better understood thanks to the concrete exemplary embodiment which is given by way of guidance but without limitation, and which is illustrated by the attached diagrams, in which:

- Figure 1 is a general view of an installation for producing a nonwoven web of the spunbond type;
- Figure 2 is a detail view showing schematically the structure and functioning of an assembly for the opening of the bundle of filaments which is formed and its deposition on the receiving belt;
- Figure 3 illustrates a variant embodiment according to the invention in which the electrostatic charging of the filaments is obtained by way of a rail integrated inside the diffuser, it being possible for the flow of air inside the latter against the walls to be produced either by natural indraught of the outside air, or by a system of injection under low pressure less than one bar.

Way of carrying out the invention

Referring to the attached figures, the device according to the invention is thus intended for use on a

line for producing a nonwoven textile web consisting of continuous synthetic filaments.

Generally speaking, as can be seen from Figure 1, such an installation is thus composed essentially of at least one extruder, designated by the general reference (1), which feeds synthetic polymer, such as polyamide, polyethylene, polyester, etc., to a spinneret (2) for the formation of a curtain of filaments (3)

From a practical point of view, by way of guidance, the spinneret consists of a plate each containing a multitude of holes, for example 5000 per metre of width and having a diameter depending on the extruded filaments, for example of 0.5 mm. These holes are distributed over a plurality of parallel rows, for example over eighteen rows, and over a width at the spinneret outlet of 140 mm.

At the outlet of this spinneret is arranged the cooling assembly (4) for adjusting the temperature of the filaments depending on the polymers and composed for example of a plurality of successive zones (4a,4b,4c) for subjecting the curtain of filaments (3) to traversing air flows, the speed and temperature of which may be adjusted.

By way of guidance, the length of this cooling zone is of the order of 1200 mm and the temperature and speed of each of the zones decreases from the first zone (4a) to the third zone (4c).

Downstream of this cooling zone is arranged the actual drawing assembly (5), which is in the form of a closed enclosure having a slot (F) into which air is injected under pressure, for example of the order of 0.5 bar.

Such a drawing system makes it possible to bring about the suction of the curtain of filaments and its entrainment by high-speed air streams for effecting the drawing.

At the outlet of the drawing assembly (5), the bundle of filaments (3) is projected onto the receiving belt (7) by way of an assembly (6), which assembly forms the subject of the invention and the two embodiments of which can be seen in Figures 2 and 3, and which causes the air flow leaving the slot (5) to deviate and slow down, thus bringing about the opening of the bundle of filaments.

In the first embodiment illustrated in Figure 2, such an assembly comprises, close to the outlet of the drawing slot (F) of the assembly (5), on the one hand, a diffuser, designated by the general reference (10), consisting essentially of a divergent nozzle which extends over the entire width the production of the web and, on the other hand, downstream of this opening assembly, a rail (11) for electrostatically charging the filaments at the outlet of the assembly (10), bringing about an opening at the heart of the said bundle of filaments before they are deposited on the receiving belt (7).

In this embodiment, the diffuser assembly (10) is composed essentially of a chamber (12) having an inner slot (13) in the form of a convergent/divergent nozzle extending over the entire width of the installation opposite the outlet of the drawing slot (F) of the assembly (5).

Opening into this slot (13), close to the lower part of the divergent zone, are two laterally arranged symmetrical slots (14). These symmetrical slots (14) may be either connected to a source of compressed air injected under a pressure less than 1 bar and advantageously of the order of 0.4 bar, or be simply open to the outside air.

The divergent zone is, in this embodiment, extended by two walls (15) which are likewise divergent.

Arranged immediately downstream of this diffuser assembly, or where appropriate integrated inside the latter, is a conventional rail (11) for electrostatically charging the filaments, thus making it possible to intensify the opening of the bundle. Such a rail (1) is a conventional rail, for example of the type described in US-A-3 967 118.

Figure 3 illustrates a second embodiment of an assembly for opening and distributing a bundle of filaments in the form of a web produced in accordance with the invention.

In this variant, using the same references as those employed to describe the example illustrated by Figure 2, the device for opening and distributing the bundle of filaments (6) is, as before, separated from the drawing assembly (5).

This embodiment also comprises an inlet zone (13) in the form of a convergent nozzle extending opposite the outlet of the drawing slot (F). This inlet zone (13) in the form of a convergent nozzle is connected to the two walls (15) of the divergent zone by a rectilinear slot (20).

The rail (11) for electrostatically charging the filaments is, in this embodiment, integrated inside the diffuser, at the end of the rectilinear slot (20) immediately upstream of the divergent zone (15).

An indraught of air coming from outside owing to the venturi effect is produced through the two adjacent lateral slots formed by the lower face of the drawing assembly (5)

and the upper face of the opening and distributing assembly (6).

An air flow thus arises along the walls (20,15) over the opening and distributing assembly.

Where appropriate, as in the embodiment described in conjunction with Figure 2, an injection of air under low pressure, less than 1 bar, could be produced at the two lateral slots formed between the drawing assembly (5) and the opening and distributing assembly (6).

It was found that with such a device not only was a perfect opening of the bundle of filaments obtained, but that, furthermore, the reception on the belt (7) was very regular and led to a very homogeneous nonwoven web being obtained.

Of course, the invention is not limited to such an embodiment, but covers any variants thereof realised in the same spirit.

CLAIMS

1. Device for opening and distributing a bundle of filaments during the production of a nonwoven textile web, according to the technique which consists:

- in extruding a melted organic polymer through a spinneret perforated with holes, so as to form a bundle or curtain of filaments;
- then, in orienting the extruded filaments by drawing by means of one or more fluid-jet devices (5);
- and finally, in receiving the bundle of filaments in the form of a web on a movable receiving belt below which is arranged a suction source,

characterised in that it consists of an assembly (6) arranged downstream of the outlet of the drawing assembly (5) and separated therefrom, the said assembly comprising, arranged close to the outlet of the drawing slot (F), a diffuser (10) comprising an inlet zone (13) in the form of a convergent nozzle extending over the entire width of the installation opposite the outlet of the drawing slot (F) for producing the web, extended by a divergent nozzle (15), the said assembly being associated with a rail (11) electrostatically charging the filaments before they are received on the receiving belt (7).

2. Device according to Claim 1, characterised in that the diffuser (10) comprises an inlet zone (13) in the form of a convergent nozzle connected to the two walls (15) of the divergent zone by a rectilinear slot (20), the rail (11) electrostatically charging the filaments being mounted at the level of the rectilinear slot immediately upstream of the divergent zone (15).

3. Device according to one of Claims 1 and 2, characterised in that an indraught of air owing to the venturi effect is produced between the faces opposite the

outlet of the drawing slot (5) and the inlet of the diffuser assembly (6), creating a an air flow against the walls (15) of the divergent zone.

4. Device according to Claim 3, characterised in that an injection of air under a pressure less than 1 bar is produced between the faces opposite the outlet of the drawing slot (5) and the inlet of the diffuser assembly (6).

Abstract

DEVICE FOR OPENING AND DISTRIBUTING A BUNDLE OF FILAMENTS DURING THE PRODUCTION OF A NONWOVEN TEXTILE WEB

The invention concerns a device for opening and distributing a bundle of filaments when producing a nonwoven textile web by a technique which consists in : extruding melted organic polymer through a die perforated with holes, so as to form a bundle or curtain of filaments; then directing the extruded filaments by drawing by means of one or several fluid jets ; and finally, receiving the bundle of filaments in the form of a web on a mobile conveyor belt. The invention is characterised in that it consists of an assembly arranged downstream of the outlet of the drawing assembly and separate therefrom, said assembly comprising, arranged in the proximity of the drawing slot outlet, a diffuser comprising an intake zone shaped as a convergent nozzle extending over the whole width of the installation opposite the drawing slot outlet producing the web, extended by a divergent nozzle, said assembly being associated with a ramp electrostatically charging the filaments before they are received on the receiving belt.

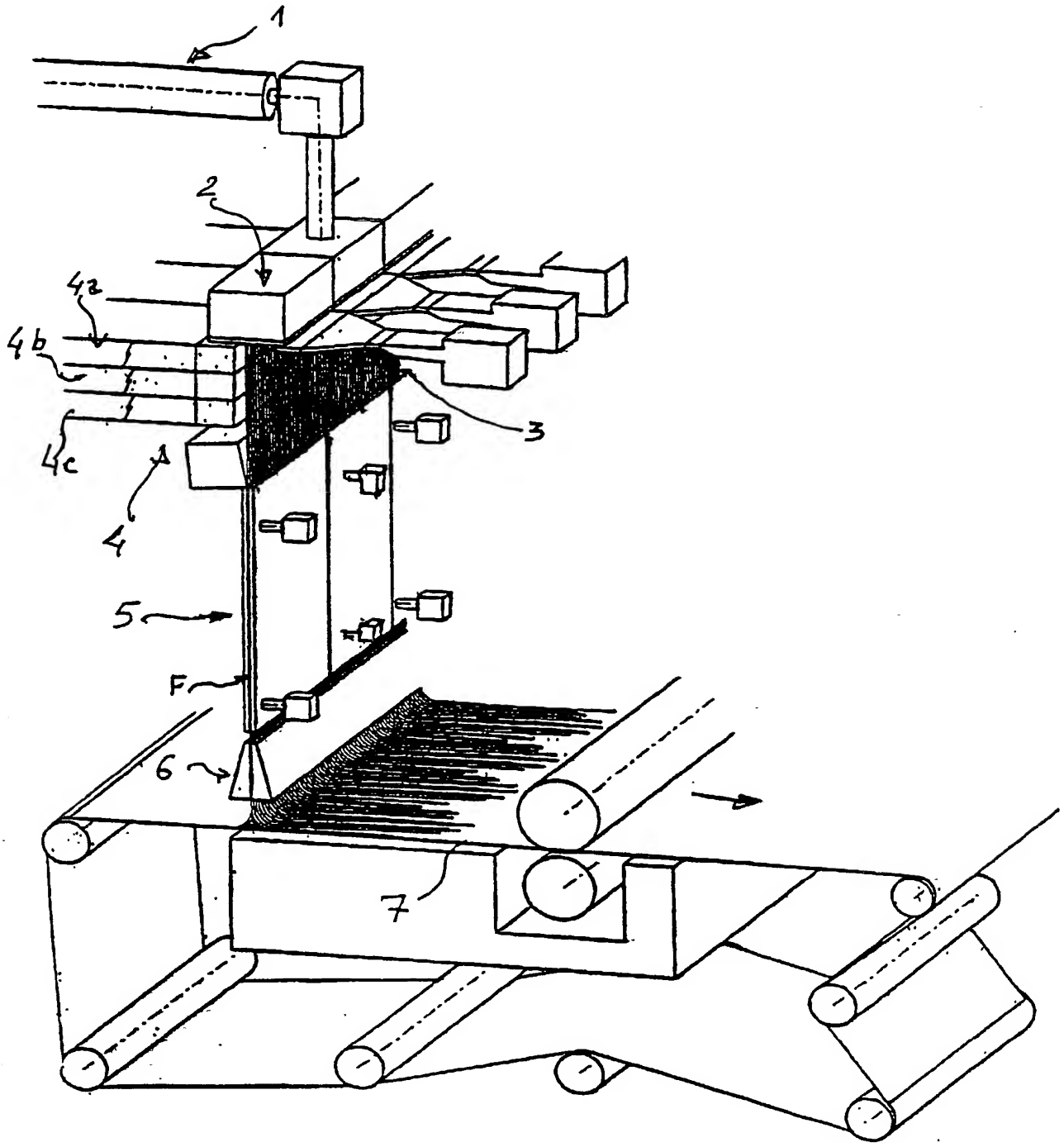

FIG.1

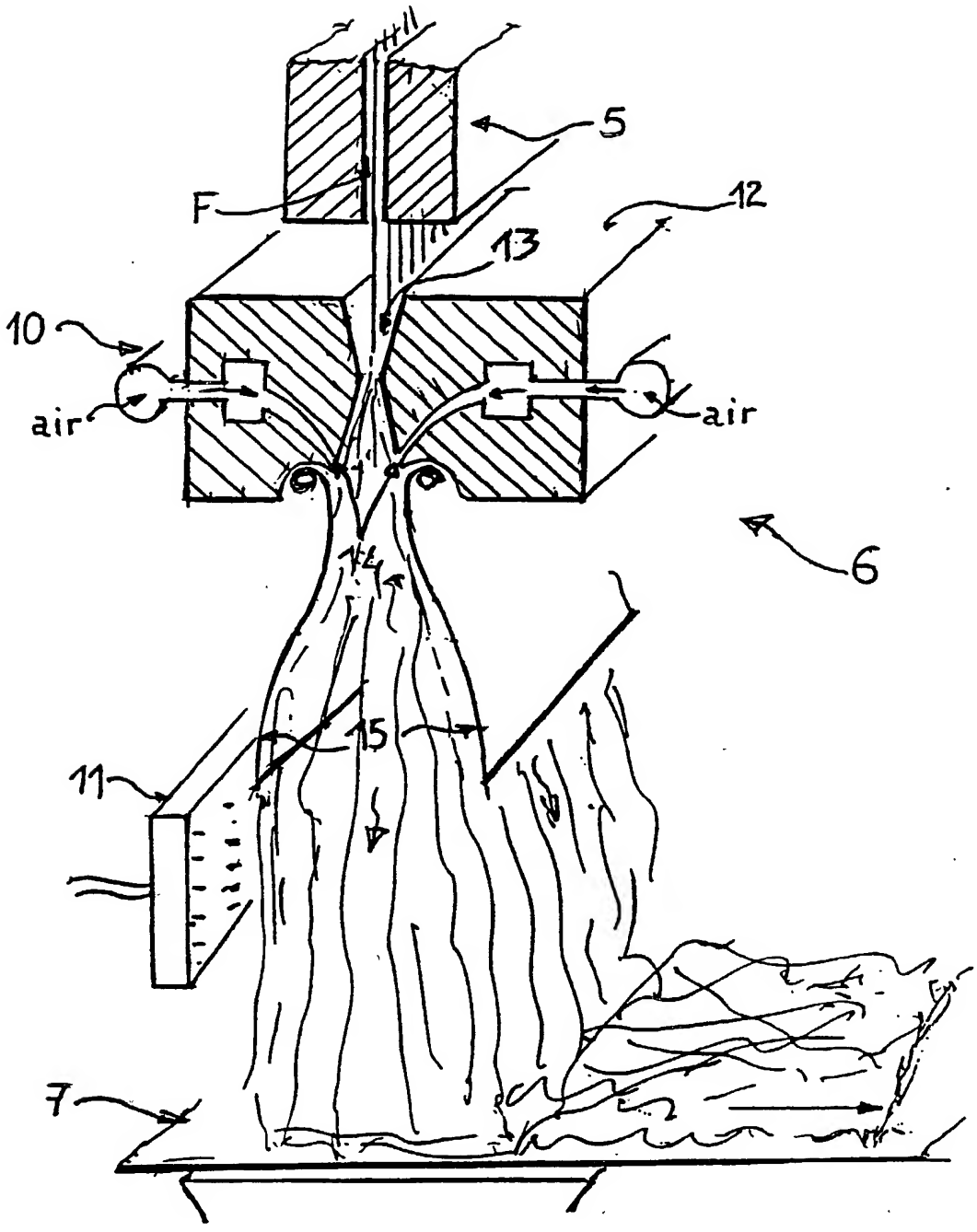

FIG.2

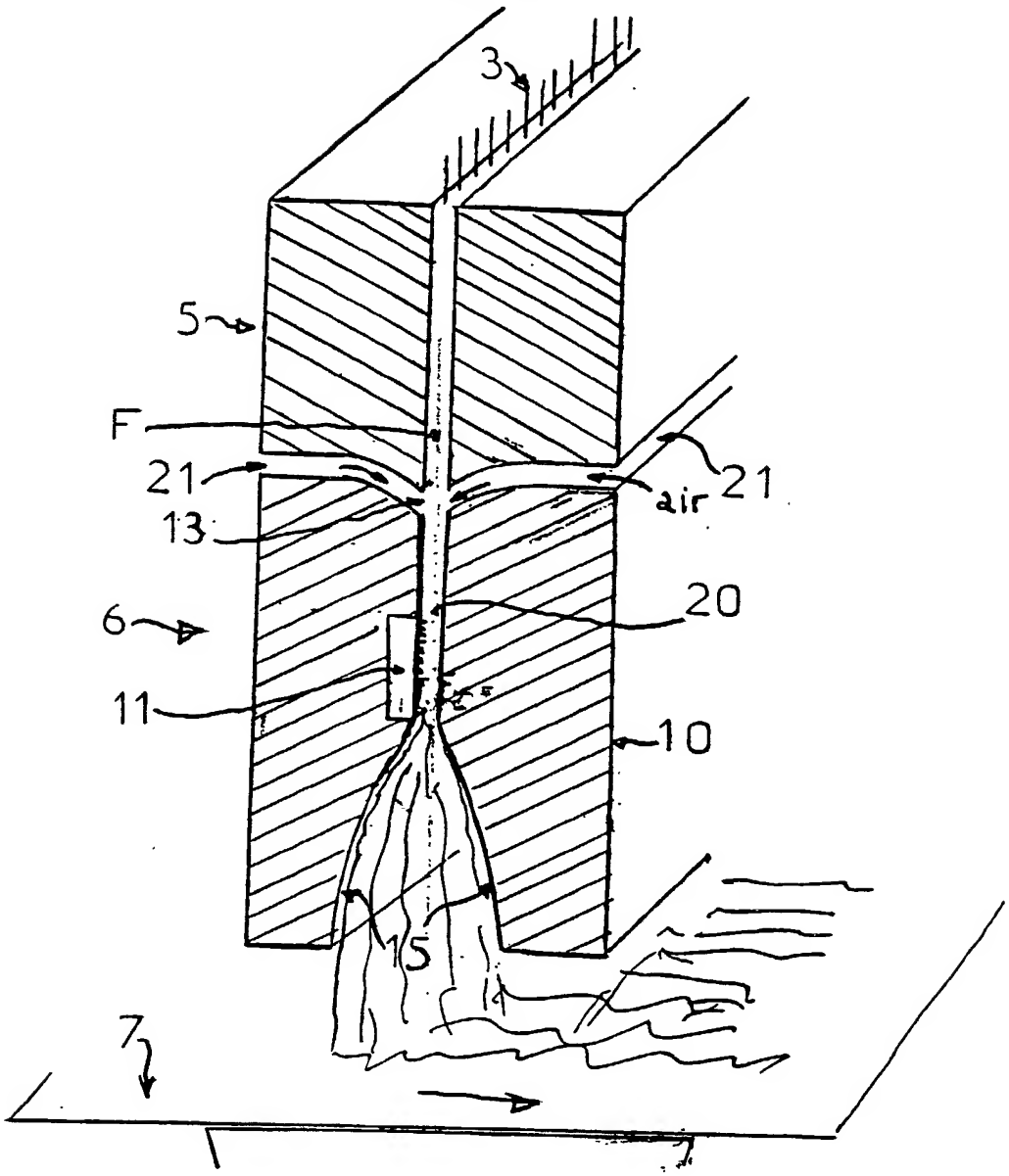

FIG 3

Attorney's Docket No. 34051

COMBINED DECLARATION AND POWER OF ATTORNEY IN ORIGINAL APPLICATION

(Sole or Joint - Foreign)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Device for opening ans distributing a bundle of filaments when producing a nonwoven textile web.,

the specification of which

_____ is attached hereto.

__X__ was filed on April 20,2000 as PCT international application Serial No. PCT/FR00/01050 and was amended on _____.

I hereby state that I have reviewed and understand the content of the above-identified specification, including the claims (Pearne, Gordon, McCoy & Granger Docket No. _____), as amended by any amendment referred to above. I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119, of any foreign application(s) for patent or inventor's certificate listed below, and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Country	Application Number	Filing Date (day/month/year)	Priority Claimed? Yes	No
FRANCE	99 05403	23/04/1999	X	

I hereby designate the following as my mailing address and telephone number:

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(Control No. 000116)

and appoint each of the following as my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Charles B. Gordon, Reg. No. 16923
William C. McCoy, Reg. No. 16885
Richard H. Dickinson, Jr., Reg. No. 18622
Thomas P. Schiller, Reg. No. 20677
David B. Deioma, Reg. No. 22841
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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